

EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS
ON THE KISATCHIE NATIONAL FOREST, LOUISIANA

by

L. E. Drake^{1/}

INTRODUCTION

Since the late 1960's or early 1970's, the southern pine beetle has been a problem in most pine tree producing areas of Louisiana, including the Kisatchie National Forest. Since that time, beetle populations have periodically fluctuated between endemic and epidemic status.

In July 1976, an evaluation was conducted on the Kisatchie National Forest (Fig. 1) by personnel of the Forest Insect and Disease Management Group to determine the current status of the southern pine beetle population.

Results of the evaluation indicate that the beetle population is currently epidemic throughout the Forest. It is estimated that nearly 5,000 MBF of timber are affected by the southern pine beetle on this area.

METHODS

Standard aerial sketch-map procedures were used for this evaluation.^{2/} Aerial survey coverage was 50 percent. Spots of dead or dying trees were recorded and those that could be accurately located were plotted on photo index sheets. Aerial survey results were corrected according to data by Aldrich et al. (1958) to compensate for observer error and expanded to 100 percent area coverage. Fifty-seven spots

^{1/} Entomologist, U.S.F.S., Southeastern Area, S&PF, FI&DM Group, Pineville, Louisiana.

^{2/} Detection of Forest Pests in the Southeast. 1970, USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF 7, Atlanta, Georgia. 51 p.

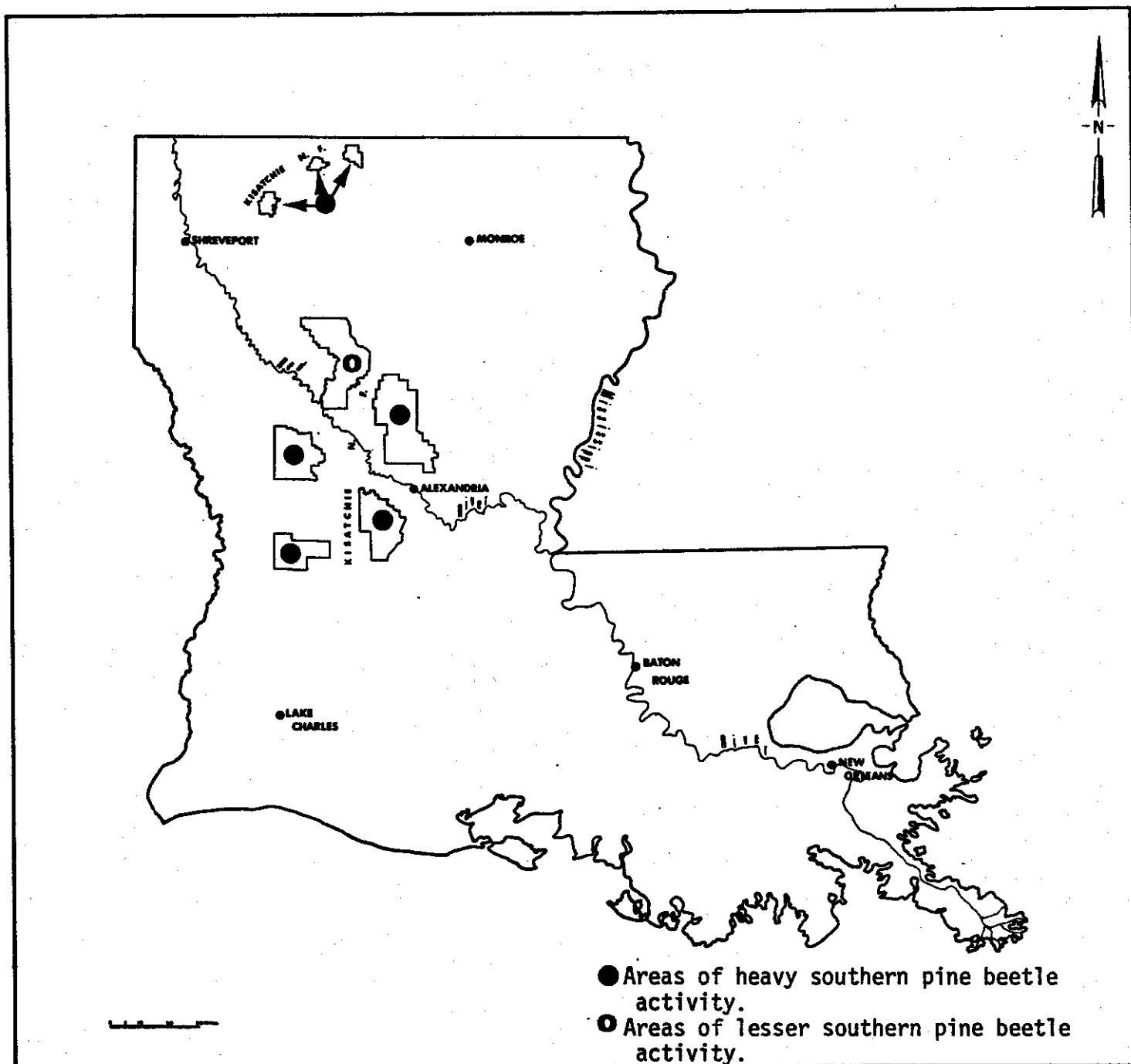


Figure 1.--Location of evaluated areas, showing districts with high and low beetle activity, Kisatchie National Forest, Louisiana, July 1976.

containing 1,807 affected trees were examined on the ground throughout the six forest ranger districts to determine the cause of tree mortality, number and volume of infested and affected trees, and the general condition of the beetle population.

TECHNICAL INFORMATION

Causal Agent - *Dendroctonus frontalis*, Zimm.

Host Trees Attacked - The southern pine beetle attacks all species of southern yellow pine. On this forest, however, loblolly pine, *Pinus taeda* L. and shortleaf pine, *Pinus echinata* are the preferred hosts.

Type of Damage - Damage caused by the southern pine beetle is tree mortality resulting from adult beetles constructing egg galleries in the cambial region of the host trees. Blue-staining fungi, *Ceratocystis* spp., introduced by the causal agent, other bark beetles and secondary insects, accelerate the kill and reduce the salvage value.

Life Cycle of the Insect - The beetles attack in pairs and construct winding egg galleries in the cambium. Eggs are deposited along the galleries. Eggs hatch into whitish grubs that further mine the cambium and then construct pupal cells in the outer bark. After transforming to adults, the beetles emerge. During the warmer months, the life cycle is completed in about 30 days. There may be as many as seven generations produced each year.

RESULTS AND DISCUSSION

Results of this evaluation are summarized in Table 1. Corrected data show that there is currently an estimated 5,180 spots containing 37,469 dead or dying trees well scattered within the protection boundaries of the Kisatchie National Forest. Of these, 15,922 are currently infested with active southern pine beetle broods. The number of infested trees per M acres host type is 23.2. Infestations ranged from singles to over 300 trees. The total current volume infested is 2,113.67 MBF, and the total affected volume is 4,821.67 MBF.

The heaviest beetle activity is now on the Kisatchie Ranger District which has an infested volume of 1,083.4 MBF and 48.0 infested trees per M acres host type. The least amount of beetle activity is occurring on the Winn District, which currently has an estimated infested volume of 56.23 MBF and 3.64 infested trees per M acres host type. The beetle population on this forest has been near endemic for the past several years. However, based on the high

Table 1. Summary of the results of southern pine beetle evaluations conducted on the Caney, Catahoulas, Evangeline, Kisatchie, Vernon, and Winn Ranger Districts, Kisatchie National Forest, Louisiana. July 1976^{1/} ^{3/}

	Catahula	Winn	Caney	Ownership Unit (Districts)				Total
				Kisatchie	Evangeline	Vernon ^{2/}		
1. Results compiled from data collected during the aerial phase of the evaluation								
Survey type	50 Percent Aerial Sketch Map							
Date of Survey	July 1976							
Total acreage surveyed	185,897	290,955	60,093	175,639	193,898	Approx. 55,000		962,273
Total susceptible host type acreage	153,591	233,962	37,553	124,973	77,837	40,000		667,916
Total number of spots within survey boundaries	964	1,114	368	1,170	1,058	506		5,180
Spots per M acres host type	6.2	4.8	9.8	9.4	13.5	12.7		7.7
Average spot size (trees)	8.7	3.2	4.5	10.7	6.6	8.2		7.2
Range of spot sizes (trees)	1-50	1-25	1-20	1-200+	1-50	1-50		1-200+
Reds and faders per M acres host type	21.8	11.0	35.5	8.2	7.6	84.0		26.2
2. Results compiled from data collected during ground and aerial phases of the evaluation								
Date of ground phase	July 1976							
Total number of infested trees	3,712	852	524	6,002	2,991	1,841		15,922
Infested trees per M acres host type	27.4	3.64	13.9	48.0	38.4	46.0		23.2
Total volume of infested trees (MBF)	400.9	56.2	92.7	1,083.4	275.2	205.3		2,113.7
Total number of affected trees	8,427	3,589	1,665	12,540	7,059	4,189		37,469
Total volume of affected trees (MBF)	910.1	236.9	294.7	2,263.5	649.4	467.1		4,821.7
Ratio of green infested to total red and fading trees	0.86:1	0.18:1	0.51:1	1.02:1	0.75:1	1.15:1		0.78:1

^{1/} Corrected and expanded data.

^{2/} Only the unrestricted portion of the Vernon R.D. surveyed.

^{3/} Includes both Federal and Private land within Ranger District protection boundaries.

number of spots and infested trees per M acres host type, the beetle is now epidemic throughout the forest. There is currently more timber affected on the forest than was treated or salvaged during all of FY 1976.

Beetle brood survival in infested trees appeared to be high even though predatory larvae of the checkered beetle, *Thanasimus dubius*, were numerous. The impact of these and other predators and parasites on the southern pine beetle populations is not known.

Systems for accurately predicting southern pine beetle population trends are being developed. For the present, current population status adjusted by entomological and operational experience serve as a basis for making broad estimates of future population trends. This insect has a high biotic potential and when conditions are favorable for its development, rapid population increases can occur that could result in widespread and extensive timber losses.

A considerable number of the beetle infestations reported in Table 1 are located on intermingled private land within the protection boundaries of the six ranger districts of the Kisatchie National Forest. The intensity of control efforts on these private holdings is not known. These infestations, along with those on private land outside the forest protection boundaries, if not controlled, could serve as a reservoir for beetles to reinfest timber stands on federal land, thus reducing the effectiveness of control actions by the National Forest. Maximum effectiveness for southern pine beetle control can be achieved only when all known infestations in a biological unit are suppressed.

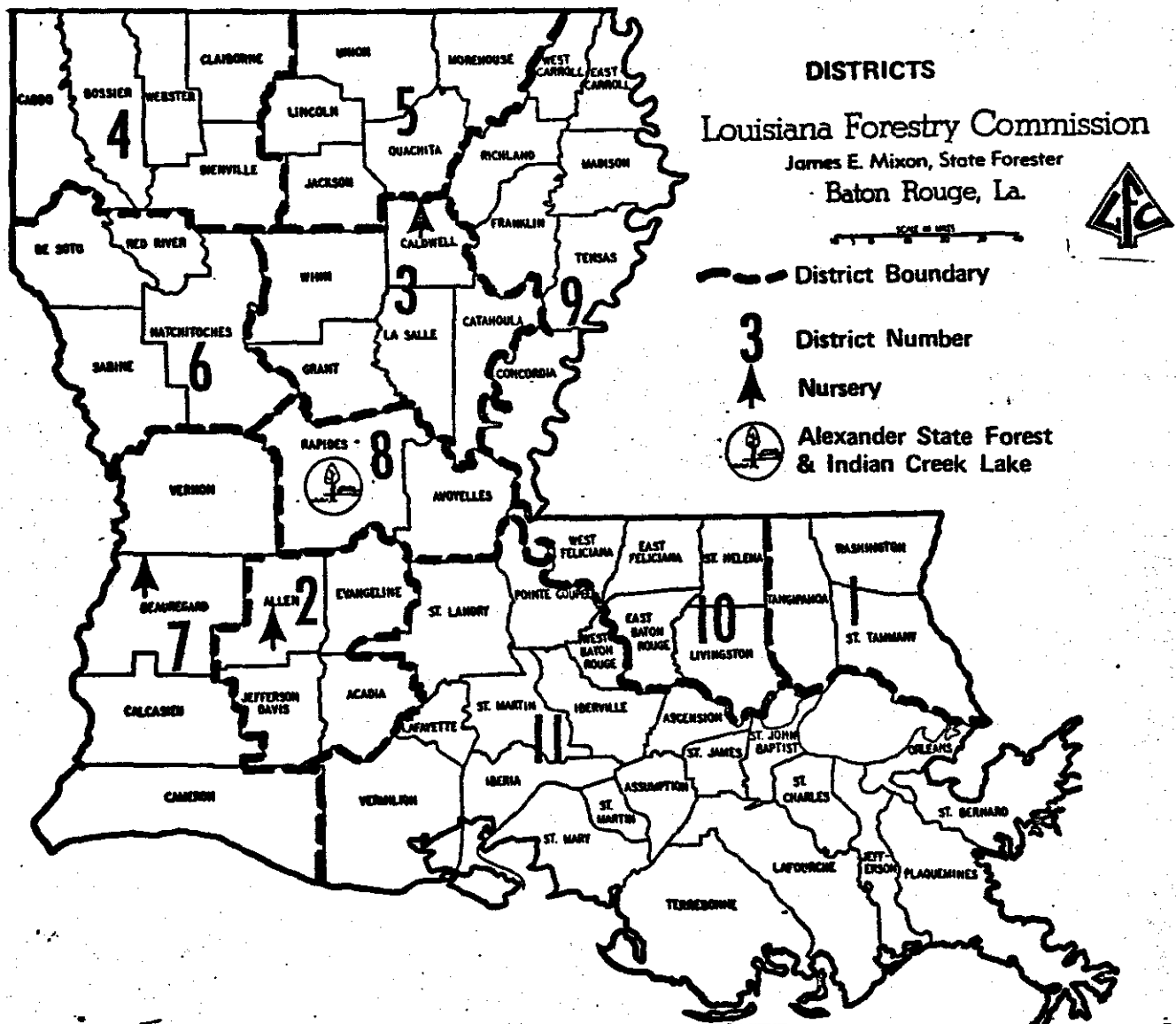
RECOMMENDATIONS

1. Perhaps the most opportune time to effectively reduce the beetle population is during the winter months when lower temperatures slow development of over-wintering broods. In an effort to minimize timber losses next year, suppression efforts should be accelerated immediately and continued through the winter.
2. Emphasis should be placed on controlling larger spots in areas of heaviest infestation.
3. All control efforts should be carried out in accordance with guidelines set forth in FSM 5250, SA Supplement No. 8, and the Kisatchie National Forest Southern Pine Beetle Project Control Plan.

4. The local Louisiana Forestry Commission Office should be advised of the beetle status and spot location on intermingled private lands within the forest protection boundary. These contacts are noted in Figure 2.
5. Outbreak status will be monitored by FI&DM personnel throughout fall and winter 1976-77. Another evaluation will be made during the late spring or summer of 1977.
6. A refresher training session in detection, identification, and suppression of the southern pine beetle should be conducted by FI&DM personnel for personnel of the Kisatchie National Forest as soon as possible.

REFERENCES

1. Aldrich, R. C., R. C. Heller and W. F. Bailey. 1958. Observation limits for aerial sketch mapping southern pine beetle damage in the southern Appalachians. J. For. 56(3):200-203.



DISTRICT FORESTERS

D-1 Leo Westmoreland
Louisiana Forestry Commission
P. O. Box 1118
Houma, Louisiana 70401
Phone - 345-2791

D-2 Donald I. Campbell
Louisiana Forestry Commission
P. O. Box 459
Oberlin, Louisiana 70655
Phone - 639-4978

D-3 John H. Greene
Louisiana Forestry Commission
P. O. Box 578
Gila, Louisiana 71465
Phone - 495-5218

D-4 William C. Ruffin
Louisiana Forestry Commission
P. O. Box 550
Minden, Louisiana 71055
Phone - 377-2484

D-5 Lonnie B. White
Louisiana Forestry Commission
122 St. John Street, Room 329
State Office Building
Moures, Louisiana 71201
Phone - 322-6121, Exts. 204-206
Nights, Weekends, Holidays 325-6311

D-6 James H. Harris
Louisiana Forestry Commission
P. O. Box 137
Natchitoches, Louisiana 71457
Phone - 352-3595

D-7 Dean H. Burns
Louisiana Forestry Commission
P. O. Box 347
De Ridder, Louisiana 70634
Phone - 463-7801 or 463-4324

D-8 Lamar E. Jeffrion
Louisiana Forestry Commission
Alexander State Forest
Woodworth, Louisiana 71485
Phone - 445-4511

D-9 John B. Planché
Louisiana Forestry Commission
P. O. Box 32
Winnsboro, Louisiana 71295
Phone 435-4147

D-10 Carlton Hurst
Louisiana Forestry Commission
P. O. Box 8
Clinton, Louisiana 70722
Phone - 683-5862

D-11 Ernest G. Miller
Louisiana Forestry Commission
State Office Building, Room 636
302 Jefferson
Lafayette, Louisiana 70501
Phone - 233-4211, Ext. 311

Figure 2.